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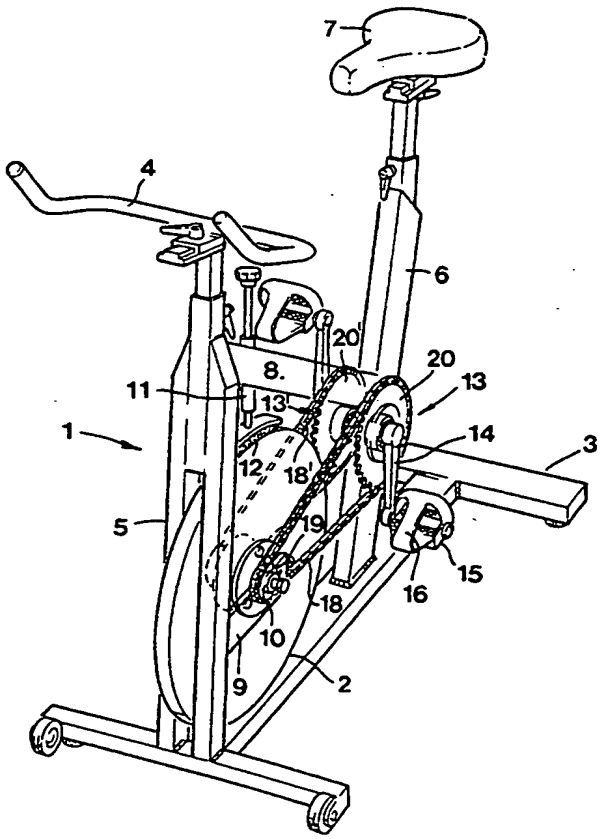
**Published**
*With international search report.*
*Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*
*In English translation (filed in Swedish).*

(54) Title: BICYCLE

(57) Abstract

A bicycle comprises a frame (1) and a wheel (2) rotatably mounted in relation thereto, which wheel is drivable by means of two pedal devices (13, 13') including pedal-equipped arms (14). The two pedal devices (13, 13') are individually mounted in different bearings and connected to the wheel (2) via two different transmissions (18, 18'), which separately co-operates with a mechanical clutch which comprises a dog being movable to and for opposite shoulder surfaces of which a first one guarantees driving the wheel (2) when the dog in an active state is pressed against the same, and the second one gives rise to noise when the dog in an inactive state collides with the same.



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# BICYCLE

## Technical Field of the Invention

This invention relates to a bicycle of the type that comprises a frame and a wheel rotatably mounted in relation thereto, which wheel is drivable by means of two pedal devices having pedal-equipped arms.

## Background of the Invention

In previously known training bicycles, which in more modern versions frequently are used for so called spinning, the two pedal devices are oriented in 180° to each other and rigidly united to a mutual shaft to which a chain wheel for one single transmission in the form of an endless chain is rigidly united, which transmits the driving power to the wheel, which power the exercising person applies to the pedals via his/her legs. In practice, this construction gives a mediocre and partly monotonous training of the body. Thus, energy demanding power transmission from the legs of the user to each individual pedal device takes place in the main only the half revolution during which the pedal device is brought to move in the direction forwards from the area of an upper dead centre to the area of a lower dead centre. During the return movement backwards from the lower dead centre towards the upper dead centre, the individual leg is, however, kept in all essentials in a position of rest so far that the same inactively accompanies the pedal in question when the other leg depresses the opposite pedal. This pattern of movement results in a low physiological degree of efficiency, inasmuch as the individual leg's own weight (which frequently is within the range of 15-25 kg) contributes to apply the individual pedal force during the single movement which requires marked energy consumption, viz. the depression, as well as inasmuch as only certain muscle groups in, above all, the exercising person's legs, back and stomach need to be activated during the movement of depression, viz. the muscles which can apply the pedal compressive force.

Objects and Features of the Invention

The present invention aims at obviating the above-mentioned shortcomings of previously known bicycles and at providing an improved bicycle. Thus, a primary object of the invention is to provide a bicycle which enables a more all-round training and which, by simple means, draws the user's attention to such moments when the work of the body is not carried out in a physiologically optimum way.

According to the invention, the above-mentioned object is attained by the features defined in the characterizing clause of claim 1. Preferred embodiments of the invention are furthermore defined in the dependent claims.

Brief description of the Appended Drawings

In the drawings:

Fig 1 is a perspective view of the bicycle according to the invention,

Fig 2 is a partly cut planar view showing a pedal mechanism included in the bicycle together with a balance wheel,

Fig 3 is an enlarged exploded view showing a hub construction included in the balance wheel,

Fig 4 is a side view of a clutch included in the hub construction in a first functional state, and

Fig 5 is an analogous side view showing the same clutch in a second functional state.

Detailed Description of a Preferred Embodiment of the Invention

The bicycle shown in fig 1 comprises a frame in its entirety designated 1 as well as a wheel 2 in the shape of a balance wheel rotatably mounted in relation thereto. The frame 1 is composed of a base 3, a front fork 5 provided with a support handle 4, as well as a rear upright 6 which carries a saddle 7. An intermediate piece 8 extends between the front fork 5 and the upright 6. Schematically outlined brackets 9 carrying a shaft 10 for the wheel 2 extend backwards from the two spaced-apart branches of the front fork. A brake device 11 mounted on the intermediate piece 8 has the purpose of applying a variable brake effect to the balance wheel. In the shown

example, the brake device 11 includes a lining 12 acting against the periphery of the wheel, which lining may be pressed variously hard against the wheel by means of a screw.

In order to drive the wheel 2, a mechanism is arranged including two pedal devices 13, 13' each one of which having an arm 14 with an oblique pedal 15, more precisely a pedal of the type that includes a shackle 16 in which the front part of a user's foot may be engaged.

As far as the shown bicycle has been described hitherto, the same is in all essentials previously known.

New and characteristic for the bicycle according to the invention is that the two pedal devices 13, 13' are individually mounted in two various bearings 17, 17' (see fig 2) and connected to the balance wheel 2 via two different transmissions 18, 18'. In the shown example, these transmissions consist of endless chains, known per se, which in the front are in engagement with first toothed wheels or cog wheels 19, 19' and at the rear co-operate with second cog wheels 20, 20' included in the two pedal devices 13, 13'.

Reference is now made to fig 3, which in detail illustrates the hub construction of the balance wheel. The shaft 10 is insertable in holes 21 in the brackets 9 and fixable in relation thereto by means of screws 22 and washers 23. The position of the shaft may be finely adjusted by means of set screws 24. A tube piece 25 is rotatably mounted on the shaft 10, which piece is rigidly connected to the balance wheel 2 via flanged rings 26, being pressable against the wheel via nipples 27. Although the mounting of the tube piece 25 in relation to the shaft 10 may be realized in various ways, in practice needle bearings 28 are preferred for this purpose. Furthermore, at each end of the tube piece 25, two cages 29, 29' are rotatably mounted on the shaft 10 with which cages the two front chain wheels 19, 19' are rigidly connected. Also the cages 29, 29' are advantageously mounted on the shaft by means of needle bearings 28.

In each one of the two end portions of the tube piece 25, a number of recesses 30 are provided which are separately delimited by tangentially spaced-apart, opposite shoulder surfaces 31, 32. Each such shoulder surface suitably extends ra-

dially in relation to the geometric centre axis of the shaft, i.e. perpendicularly to a tangent to the cylindric envelope surface of the shaft. In this manner, the recession gets a sector-like shape, as may be clearly seen in figs 4 and 5. In the shown example, the tube piece includes three equidistantly spaced-apart recesses. In this case, the sector-shaped recession may, for instance, have an arc length within the range of 40-80°, suitably 50-70°.

A number of dogs or fingers 33 corresponding to the number of recesses 30 are provided on the inwardly turned end portion of each cage 29, 29'. Also these fingers 33 are cross-section-wise sector-shaped, although with an arc length which is smaller than the arc length of a co-operating recess 30 in which the finger engages. In practice, the individual finger may have a sector arc length which is 15-25° less than the arc length of the recession. Like the recessions 30, the fingers 33 are equidistantly spaced-apart. By the fact that the individual finger is smaller than the appurtenant recess, the individual cage 29 and 29', respectively, may move between opposite end positions in relation to the tube piece 25, viz. between an end position in which front shoulder surfaces on the fingers abut against front shoulder surfaces in the recessions and an opposite end position in which rear shoulder surfaces on the fingers abut against rear shoulder surfaces in the recessions.

## The Function and Advantages of the Invention

The present invention is based on the understanding that physiologically optimal training results are only attained if the two legs of the exercising person continuously work entire revolutions, i.e. not only during the half revolution when the individual leg carries out a depression movement, but also during each subsequent return movement when the pedal is to be brought backwards from the lower dead centre thereof towards the upper dead centre thereof. Due to this reason, the two pedals of the bicycle according to the invention are equipped with means for fixation of the foot or shoe of the exercising person. In the shown example, the pedals 15 include a conventional shackle 16 in which the foot may be in-

serted. However, it is also feasible to form the pedal with other means for the same purpose, e.g. snap fasteners for the shoes of the exercising person. The essential thing is only that the foot may carry the pedal with it actively, not only during the depression phase but also during the return phase.

Optimum body exercise is attained when the two legs of the user continuously apply driving power to the balance wheel 2. When one of the pedals, e.g. the one which is included in the pedal device 13 for the left leg of the user, is depressed, the appurtenant clutch in the hub construction of the balance wheel will transmit power to the balance wheel by the fact that the three carrier fingers 33 of the clutch cages 29 are pressed against the front shoulder surfaces 31 such as is illustrated in fig 4. If the right leg during the simultaneous return movement for the appurtenant pedal works actively, i.e. drives or lifts the pedal upwards, also the clutch cage 29' will work in the same way, i.e. the carrier fingers of the clutch cage 29' will be pressed against the front shoulder surfaces 31 in the appurtenant recesses 30. In doing so, also the right leg drives the balance wheel in an active manner. However, if the right leg would not be activated to the same extent as the left one, the clutch cage 29' will lag behind or be offset in phase in relation to the clutch cage 29 co-operating with the left leg. This results in that each individual carrier finger on the clutch cage 29' will move a distance backwards in the appurtenant recesses and, in a very short time, collide with the rear shoulder surfaces 32 of the recessions. As has been verified through tests made, this collision gives rise to a noise which is easily audible by the user. His/her attention is then paid, in a distinct way, to the fact that the leg in question does not work as active as the other leg. This is something which in turn gives a possibility to immediately correct this way of working, simply by applying more muscular power to the leg in question.

In practice, it should be most ordinary that the lifting leg will lag behind the depressing leg. However, the construction according to the invention also enables correc-

tion of the opposite conditions, if this peradventure would occur.

A substantial advantage of the bicycle according to the invention is that the same by way of simple, mechanical means provides opportunities for an all-round body exercise in that the user is made conscious if one of the legs does not work in an optimal way, whereby instantaneous correction may take place. In other words, opportunities are provided for an intensified training during which a plurality of additional muscle groups are activated apart from the ones which are required for only depressing a pedal during half a revolution.

Feasible Modifications of the Invention

The invention is not solely restricted to the described example of embodiment. Although the invention above has been described only in connection with an immovable cycle exerciser, the same may also apply in connection with multi-wheeled, movable bicycles, e.g. racing bicycles. In the last-mentioned case, the described construction may be used not only with the purpose of intensifying the muscle work of the body, but also with the purpose of increasing the driving of a wheel and thereby the top speed of the bicycle. In other words, the invention may also be used for achieving an improved degree of efficiency in the bicycle work as such. Although the two clutches between the chains and the wheel in the example are made with three dogs co-operating with as many recesses in the tube piece mounted on the shaft, also fewer dogs, e.g. only one, may be used. It should also be pointed out that other transmissions, e.g. V-belts, might be used instead of chains. The thinner dogs may also be provided on the centre tube piece and the wider recessions may be provided in the chain wheel-equipped cages. In conclusion, it should be mentioned that the individual mounting of the pedal devices in two spaced-apart bearings makes it possible to place the pedal devices at various levels. In this way, the bicycle may be used by people with a handicap relating to legs and feet, e.g. people with differently long legs. In doing so it is also feasible to make at least one of the bearings adjustable and fixable in various positions.

Claims

1. Bicycle including a frame (1) and a wheel (2) rotatably mounted in relation thereto, which wheel is drivable by means of two pedal devices (13, 13') having pedal-equipped arms (14), c h a r a c t e r i z e d in that the two pedal devices (13, 13') are individually mounted in different bearings (17, 17') and connected to the wheel (2) via two different transmissions (18, 18'), which separately co-operates with a mechanical clutch which comprises a dog (33) being movable to and fro opposite shoulder surfaces (31, 32) of which a first one (31) guarantees driving of the wheel (2) when the dog (33) in an active state is pressed against the same, and the other one (32) gives rise to noise when the dog in an inactive state collides with the same.

2. Bicycle according to claim 1, c h a r a c t e r i z e d in that a finger (33) serves as dog and is applied on a cage (29, 29') co-operating with the individual transmission (18, 18'), which cage is rotatably mounted in relation to a central shaft (10) for the wheel (2), and which engages a recess (30) in a part (25) rigidly united with the wheel (2) and delimited between said first and second shoulder surfaces (31, 32).

3. Bicycle according to claim 2, c h a r a c t e r i z e d in that the cage (29, 29') has three fingers (33) which engage a corresponding number of recesses (30) in said wheel part (25).

4. Bicycle according to any one of the preceding claims, c h a r a c t e r i z e d in that the individual transmission consists of an endless chain (18, 18') which is in engagement with a first chain wheel (19, 19') being connected to the clutch, as well as a second chain wheel (20, 20') which is connected to the pedal device (13, 13').

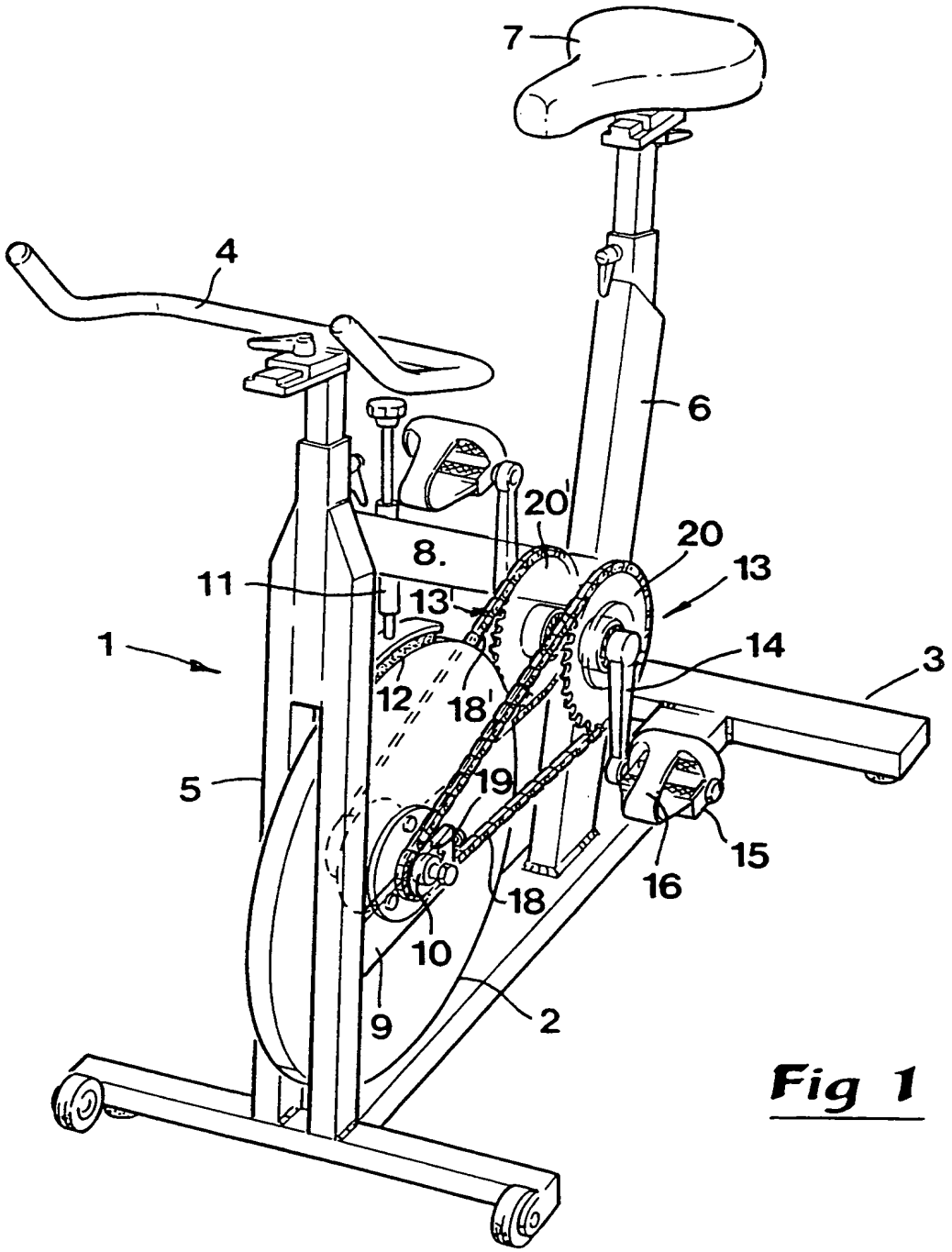


Fig 1

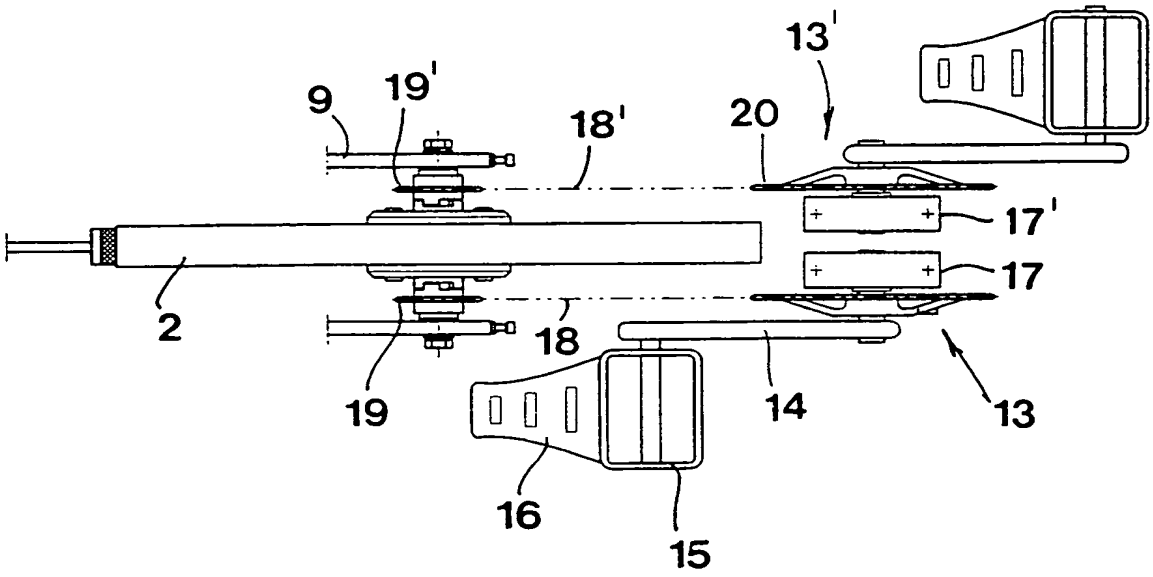


Fig 2

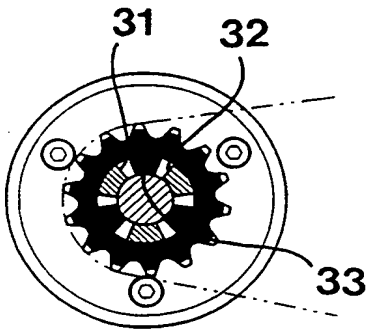


Fig 5

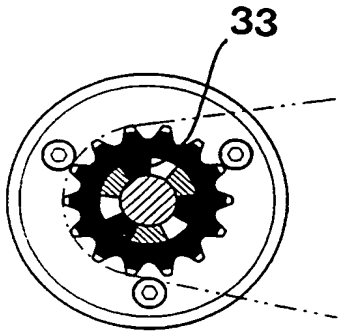


Fig 4

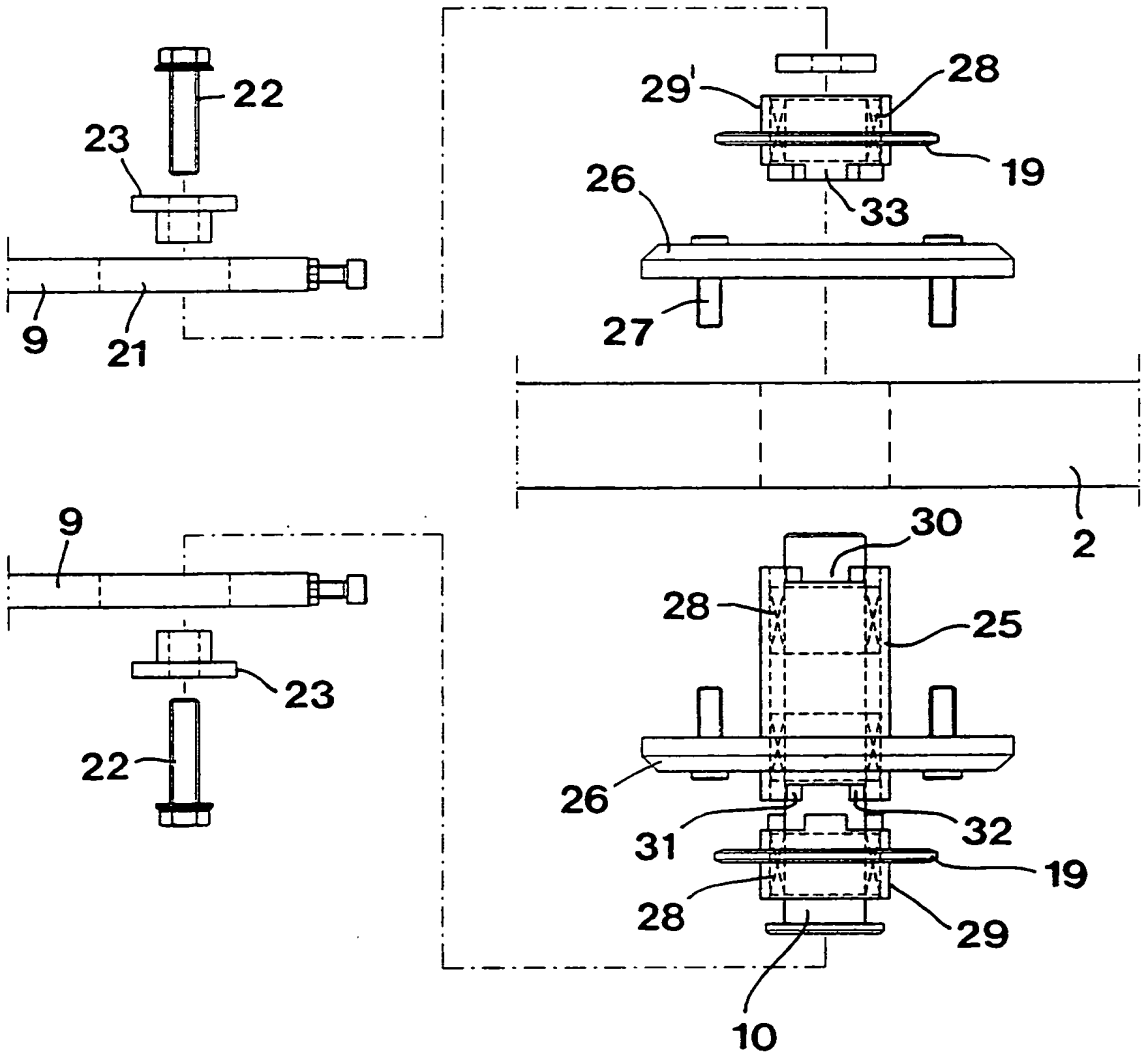


Fig 3

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 99/00915

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A63B 22/08, A63B 69/16
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | US 5735774 A (J.D. MARESH), 7 April 1998 (07.04.98) -- | 1-5 |
| A | US 5433680 A (P.D. KNUDSEN), 18 July 1995 (18.07.95) -- | 1-5 |
| A | US 4550906 A (D. IM), 5 November 1985 (05.11.85) -- -------- | 1-5 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 7 Sept 1999 | 01 -10- 1999 |
| Name and mailing address of the ISA<br>Swedish Patent Office<br>Box 5055, S-102 42 STOCKHOLM<br>Facsimile No. + 46 8 666 02 86 | Authorized officer<br>Christer Bäcknert / MR<br>Telephone No. + 46 8 782 25 00 |

Form PCT/ISA/210 (second sheet) (July 1992)

# INTERNATIONAL SEARCH REPORT

Information on patent family members

30/08/99

International application No.
PCT/SE 99/00915

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 5735774 A | 07/04/98 | NONE | |
| US 5433680 A | 18/07/95 | NONE | |
| US 4550906 A | 05/11/85 | NONE | |

09/701306 15

PATENT COOPERATION TREATY

REC'D 11 SEP 2000

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# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| Applicant's or agent's file reference 98054 PCT | FOR FURTHER ACTION | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
|---|---|---|
| International application No. PCT/SE99/00915 | International filing date *(day/month/year)* 28.05.1999 | Priority date *(day/month/year)* 29.05.1998 |
| International Patent Classification (IPC) or national classification and IPC7 A63B 22/08, A63B 69/16 | | |
| Applicant Herbert Dieter | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

| Date of submission of the demand | Date of completion of this report |
|---|---|
| 12.10.1999 | 30.08.2000 |
| Name and mailing address of the IPEA/SE<br>Patent- och registreringsverket<br>Box 5055<br>S-102 42 STOCKHOLM<br>Telex 17978 PATOREG-S<br>Facsimile No. 08-667 72 88 | Authorized officer<br>Christer Bäcknert / MRo<br>Telephone No. 08-782 25 00 |

Form PCT/IPEA/409 (cover sheet) (January 1994)

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

International application No.
PCT/SE99/00915

## I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☒ the international application as originally filed.

☐ the description, pages _____ , as originally filed,
pages _____ , filed with the demand,
pages _____ , filed with the letter of _____ ,
pages _____ , filed with the letter of _____ .

☐ the claims, Nos. _____ , as originally filed,
Nos. _____ , as amended under Article 19,
Nos. _____ , filed with the demand,
Nos. _____ , filed with the letter of _____ ,
Nos. _____ , filed with the letter of _____ .

☐ the drawings, ~~sheets~~/fig _____ , as originally filed,
~~sheets~~/fig _____ , filed with the demand
~~sheets~~/fig _____ , filed with the letter of _____ ,
~~sheets~~/fig _____ , filed with the letter of _____ .

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, ~~sheets~~/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/SE99/00915

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Claims | 1-4 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | 1-4 | YES |
| | Claims | | NO |
| Industrial applicability (IA) | Claims | 1-4 | YES |
| | Claims | | NO |

2. Citations and explanations

The invention relates to a bicycle and more specific to the pedal arrangement thereof. In bicycle training, the training effect is only achieved during each pedal's down-stroke. A primary object of the invention is to enable a more all-round training and to draw the attention of the user to instances when he or she is not performing work in an optimal way.

The invention solves the problem by providing a bicycle with a pedal arrangement wherein each pedal is mounted in its own bearing and connected to the driven wheel via a separate transmission. Each transmission connects to the driven wheel through a mechanical clutch device. The clutch has a certain slack in it so that when the user does not drive the driven wheel and the wheel drives the pedal, the clutch gives rise to a noise. This noise makes the user aware that he or she is not performing a work and so can put on an extra effort to compensate for this.

The cited document US 4550906 A discloses a bicycle that is intended to solve much the same problem as the present invention. It does so, however, by providing a pedal arrangement wherein the angle between the pedals can be changed from the usual 180 degrees. Further, the pedals influence the same rotational axis.

The cited US 5735774 A shows a pedal arrangement wherein each pedal is individually journalled on its own axis. There is no such clutch arrangement as claimed in the present invention.

.../...

**Supplemental Box**
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

Thus, the claimed invention is new. It is also considered to be non-obvious to a person skilled in the art; there is no hint or suggestion in the cited documents to lead such a person towards the claimed invention. The claimed invention is considered to solve the stated problem.

Consequently, the claimed invention is considered to meet the criteria of novelty, inventive step and industrial applicability.

PATENT COOPERATION TREATY 09/701306

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| Applicant's or agent's file reference 98054 PCT | FOR FURTHER ACTION | see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. |
|---|---|---|
| International application No. PCT/SE 99/00915 | International filing date *(day/month/year)* 28 May 1999 | (Earliest) Priority Date *(day/month/year)* 29 May 1998 |
| Applicant Herbert Dieter | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. [ ] **Certain claims were found unsearchable** (See Box I).

2. [ ] **Unity of invention is lacking** (See Box II).

3. [ ] The international application contains disclosure of a **nucleotide and/or amino acid sequence listing** and the international search was carried out on the basis of the sequence listing
   - [ ] filed with the international application.
   - [ ] furnished by the applicant separately from the international application,
     - [ ] but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
   - [ ] transcribed by this Authority.

4. With regard to the **title**,
   - [X] the text is approved as submitted by the applicant.
   - [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,
   - [X] the text is approved as submitted by the applicant.
   - [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is:
   Figure No. 1
   - [X] as suggested by the applicant.
   - [ ] because the applicant failed to suggest a figure.
   - [ ] because this figure better characterizes the invention.
   - [ ] None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 99/00915

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A63B 22/08, A63B 69/16
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | US 5735774 A (J.D. MARESH), 7 April 1998 (07.04.98) -- | 1-5 |
| A | US 5433680 A (P.D. KNUDSEN), 18 July 1995 (18.07.95) -- | 1-5 |
| A | US 4550906 A (D. IM), 5 November 1985 (05.11.85) -- -------- | 1-5 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" erlier document but published on or after the international filing date
"L" document which may throw douhts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 7 Sept 1999 | 01 -10- 1999 |
| Name and mailing address of the ISA/<br>Swedish Patent Office<br>Box 5055, S-102 42 STOCKHOLM<br>Facsimile No. +46 8 666 02 86 | Authorized officer<br>Christer Bäcknert / MR<br>Telephone No. +46 8 782 25 00 |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

30/08/99

International application No.
PCT/SE 99/00915

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 5735774 A | 07/04/98 | NONE | |
| US 5433680 A | 18/07/95 | NONE | |
| US 4550906 A | 05/11/85 | NONE | |

# PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

## PCT

**NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES**

(PCT Rule 47.1(c), first sentence)

To:
JOHANSSON, Lars
Lars Johansson Patentbyrå AB
P.O. Box 68
S-801 02 Gävle
SUÈDE

| | |
|---|---|
| **Date of mailing** (day/month/year)<br>09 December 1999 (09.12.99) | |
| **Applicant's or agent's file reference**<br>98054 PCT | **IMPORTANT NOTICE** |

| **International application No.** | **International filing date** (day/month/year) | **Priority date** (day/month/year) |
|---|---|---|
| PCT/SE99/00915 | 28 May 1999 (28.05.99) | 29 May 1998 (29.05.98) |

**Applicant**
HERBERT, Dieter

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
   AU,CN,EP,IL,JP,KP,KR,US

   In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
   AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CU,CZ,DE,DK,EA,EE,ES,FI,GB,GD,GE,GH,GM,HR,HU,
   ID,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MD,MG,MK,MN,MW,MX,NO,NZ,OA,PL,PT,RO,RU,SD,
   SE,SG,SI,SK,SL,TJ,TM,TR,TT,UA,UG,UZ,VN,YU,ZA,ZW
   The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
   09 December 1999 (09.12.99) under No. WO 99/62600

### REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, **a demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

### REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

**The International Bureau of WIPO**
**34, chemin des Colombettes**
**1211 Geneva 20, Switzerland**

Facsimile No. (41-22) 740.14.35

Authorized officer
J. Zahra

Telephone No. (41-22) 338.83.38

RECORD COPY

09/701306

# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No. PCT/ SE 99/ 00915

International Filing Date 28-05-1999

The Swedish Patent Office
PCT International Application

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired) (12 characters maximum)* 98054 PCT

**Box No. I TITLE OF INVENTION**

"Bicycle"

**Box No. II APPLICANT**

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

NORDIC GYM I BOLLNÄS AB
Varpnäsvägen 24 B
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Sweden

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State *(that is, country)* of nationality: Sweden

State *(that is, country)* of residence: Sweden

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

**Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)**

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

HERBERT Dieter
Hammarkulletorget 14
S-424 37 ANGERED
Sweden

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: SWEDEN

State *(that is, country)* of residence: Sweden

This person is applicant for the purposes of: ☒ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

**Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

JOHANSSON Lars
Lars Johansson Patentbyrå AB
Box 68
S-801 02 GÄVLE
Sweden

Telephone No.

Facsimile No.

Teleprinter No.

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) *(mark the applicable check-boxes; at least one must be marked)*:

**Regional Patent**

- ☒ **AP** **ARIPO Patent:** **GH** Ghana, **GM** Gambia, **KE** Kenya, **LS** Lesotho, **MW** Malawi, **SD** Sudan, **SZ** Swaziland, **UG** Uganda, **ZW** Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA** **Eurasian Patent:** **AM** Armenia, **AZ** Azerbaijan, **BY** Belarus, **KG** Kyrgyzstan, **KZ** Kazakhstan, **MD** Republic of Moldova, **RU** Russian Federation, **TJ** Tajikistan, **TM** Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** **European Patent:** **AT** Austria, **BE** Belgium, **CH and LI** Switzerland and Liechtenstein, **CY** Cyprus, **DE** Germany, **DK** Denmark, **ES** Spain, **FI** Finland, **FR** France, **GB** United Kingdom, **GR** Greece, **IE** Ireland, **IT** Italy, **LU** Luxembourg, **MC** Monaco, **NL** Netherlands, **PT** Portugal, **SE** Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA** **OAPI Patent:** **BF** Burkina Faso, **BJ** Benin, **CF** Central African Republic, **CG** Congo, **CI** Côte d'Ivoire, **CM** Cameroon, **GA** Gabon, **GN** Guinea, **GW** Guinea-Bissau, **ML** Mali, **MR** Mauritania, **NE** Niger, **SN** Senegal, **TD** Chad, **TG** Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT *(if other kind of protection or treatment desired, specify on dotted line)* .....

**National Patent** *(if other kind of protection or treatment desired, specify on dotted line)*:

- ☒ **AL** Albania .....
- ☒ **AM** Armenia .....
- ☒ **AT** Austria .....
- ☒ **AU** Australia .....
- ☒ **AZ** Azerbaijan
- ☒ **BA** Bosnia and Herzegovina .....
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- ☒ **ES** Spain .....
- ☒ **FI** Finland .....
- ☒ **GB** United Kingdom
- ☒ **GD** Grenada
- ☒ **GE** Georgia .....
- ☒ **GH** Ghana .....
- ☒ **GM** Gambia
- ☒ **HR** Croatia .....
- ☒ **HU** Hungary .....
- ☒ **ID** Indonesia
- ☒ **IL** Israel .....
- ☒ **IN** India .....
- ☒ **IS** Iceland
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- ☒ **MD** Republic of Moldova .....
- ☒ **MG** Madagascar .....
- ☒ **MK** The former Yugoslav Republic of Macedonia .....
- ☒ **MN** Mongolia
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Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- ☒ ZA South Africa .....
- ☐ .....
- ☐ .....

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. *(Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)*

**Box No. VI PRIORITY CLAIM** ☐ Further priority claims are indicated in the Supplemental Box.

| Filing date of earlier application (day/month/year) | Number of earlier application | Where earlier application is: national application: country | regional application:* regional Office | international application: receiving Office |
|---|---|---|---|---|
| item (1) 24 May 1998 29/05/1998 | 9801916-9 | Sweden | | |
| item (2) | | | | |
| item (3) | | | | |

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office)* identified above as item(s): ( 1 )

* *Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.*

**Box No. VII INTERNATIONAL SEARCHING AUTHORITY**

**Choice of International Searching Authority (ISA)** *(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used)*: ISA / SE

**Request to use results of earlier search; reference to that search** *(if an earlier search has been carried out by or requested from the International Searching Authority)*: Date *(day/month/year)* Number Country *(or regional Office)*

RO/SE

**Box No. VIII CHECK LIST; LANGUAGE OF FILING**

This international application contains the following **number of sheets**:

| | | |
|---|---|---|
| request | : | 3 ✓ |
| description (excluding sequence listing part) | : | 6 ✓ |
| claims | : | 1 ✓ |
| abstract | : | 1 ✓ |
| drawings | : | 3 ✓ |
| sequence listing part of description | : | |
| **Total number of sheets** | : | 14 ✓ |

This international application is **accompanied** by the item(s) marked below:

1. ☐ fee calculation sheet
2. ☐ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☐ priority document(s) identified in Box No. VI as item(s):
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☐ other *(specify)*:

**Figure of the drawings** which should accompany the abstract: 1

**Language of filing** of the international application: Swedish

**Box No. IX SIGNATURE OF APPLICANT OR AGENT**

*Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).*

Gävle, May 27, 1999

Lars Johansson

**For receiving Office use only**

| | | |
|---|---|---|
| 1. Date of actual receipt of the purported international application: | 28-05-1999 | 2. Drawings: ☒ received: ☐ not received: |
| 3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application: | | |
| 4. Date of timely receipt of the required corrections under PCT Article 11(2): | | |
| 5. International Searching Authority (if two or more are competent): ISA / SE | 6. ☐ Transmittal of search copy delayed until search fee is paid. | |

**For International Bureau use only**

Date of receipt of the record copy by the International Bureau: 21 JULY 1999 ( 21.07.99 )

PCT/ SE 99/ 00915
28 -05- 1999



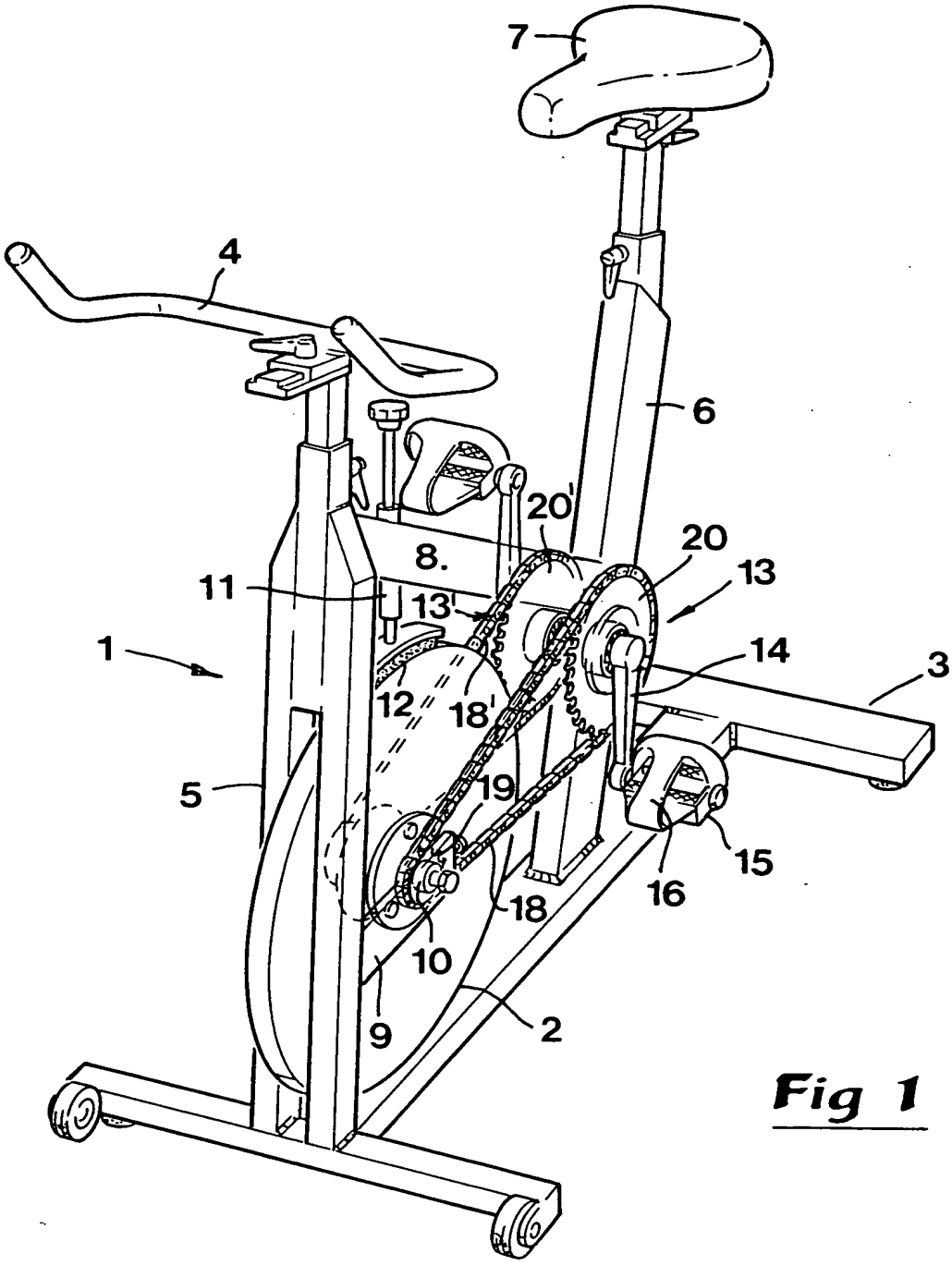


Fig 1

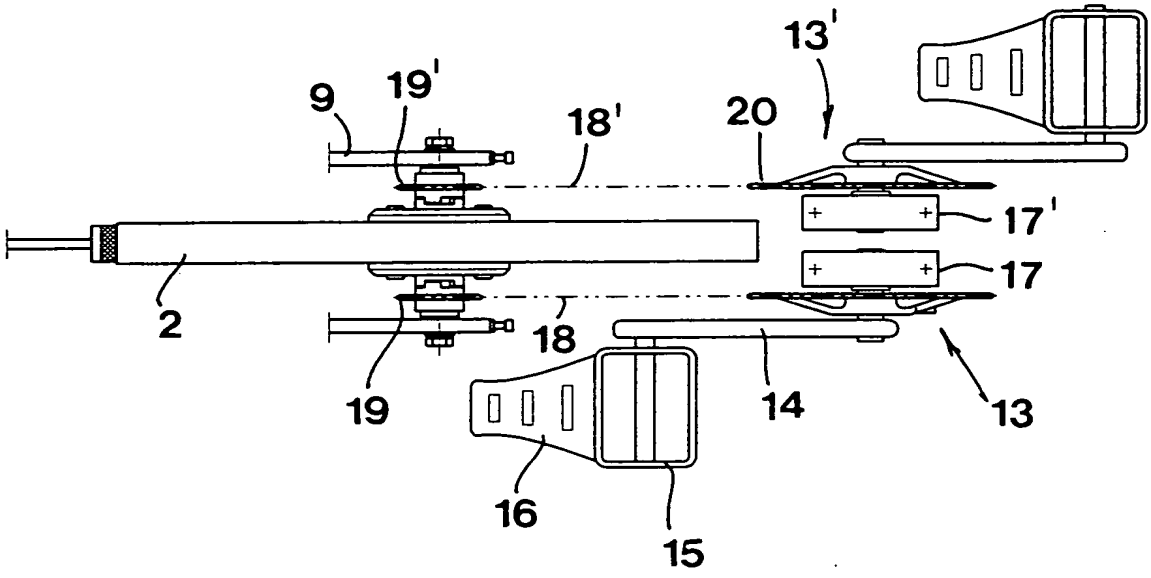


Fig 2

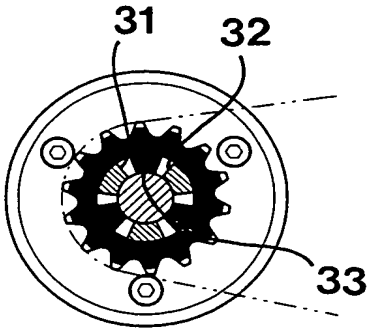


Fig 5

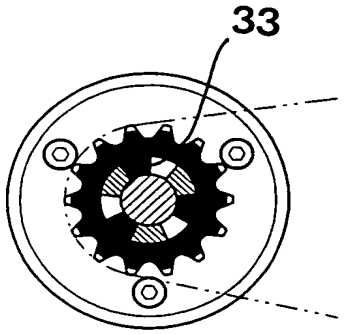


Fig 4

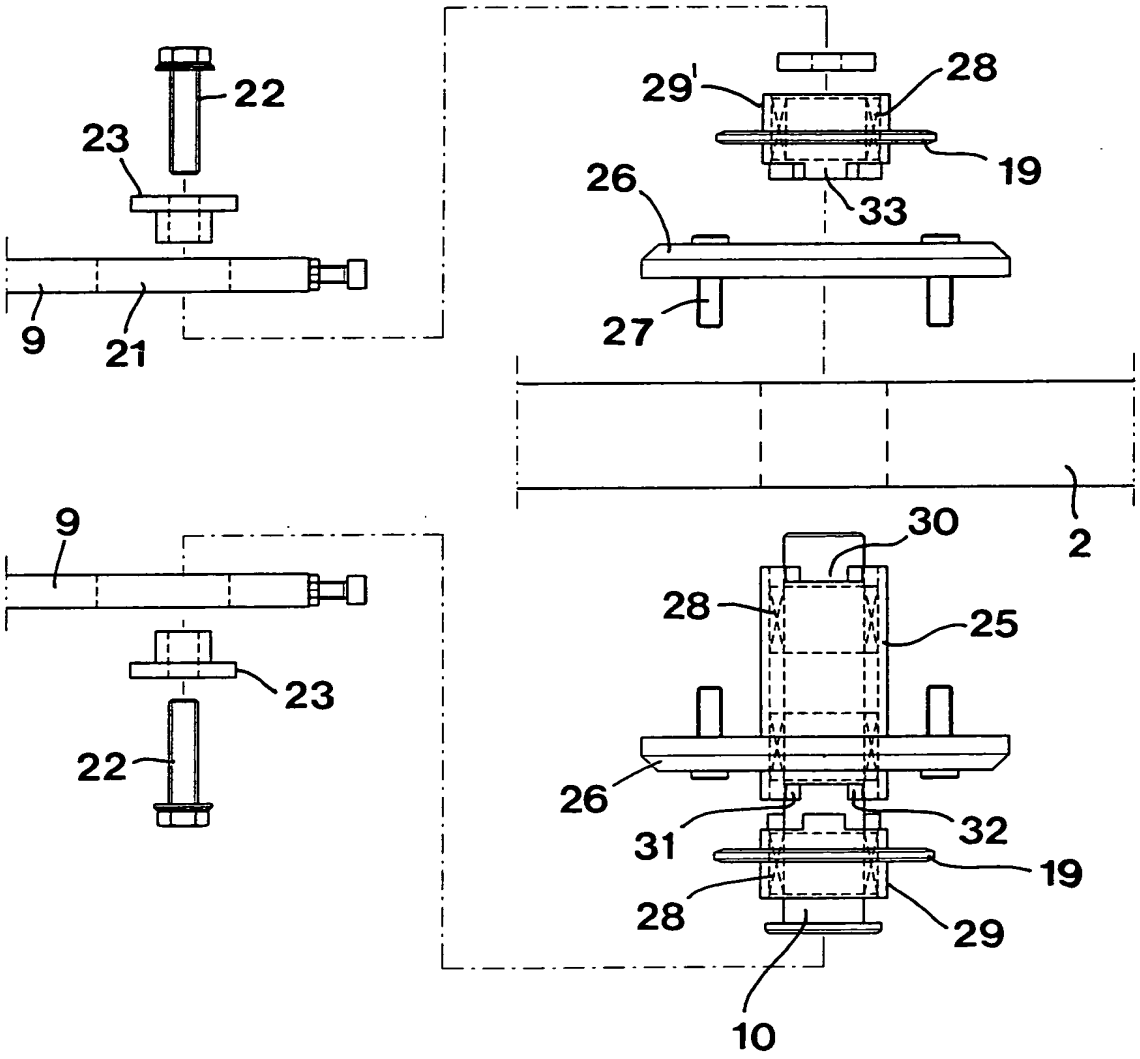


Fig 3

# CYKEL

## Uppfinningens tekniska område

Denna uppfinning hänför sig till en cykel av det slag som innefattar en stomme och ett relativt denna roterbart lagrat hjul, som är drivbart med hjälp av två trampdon med pedalförsedda armar.

## Uppfinningens bakgrund

Vid tidigare kända träningscyklar, som i modernare versioner ofta används för s.k. spinning, är de båda trampdonen orienterade i 180° mot varandra och vridstyvt förenade med en gemensam axel med vilken är vridstyvt förenad en tandkrans för en enda transmission i form av en ändlös kedja, som till hjulet överför den drivkraft som den tränande via sina ben påför pedalerna. I praktiken ger denna konstruktion en medioker och delvis ensidig träning av kroppen. Sålunda sker energikrävande krafteröverföring från användarens ben till varje enskilt trampdon i huvudsak endast det halva rotationsvarv under vilket trampdonet bringas att röra sig i riktning framåt från området av ett övre dödpunktsläge till området av ett undre dödpunktsläge. Under returrörelsen bakåt från det undre dödpunktsläget mot det övre dödpunktsläget hålls dock det enskilda benet i allt väsentligt i ett vilotillstånd såtillvida att detsamma inaktivt medföljer den aktuella pedalen då det andra benet trampar ned den motsatta pedalen. Detta rörelsemönster resulterar i en låg fysiologisk verkningsgrad, dels såtillvida att det enskilda benets egen vikt (som ofta ligger inom området 15-25 kg) bidrar till att påföra den enskilda pedalen kraft under den enda rörelse som kräver påtaglig energiåtgång, nämligen nedtrampningen, dels såtillvida att endast vissa muskelgrupper i framför allt den tränandes ben, rygg och mage behöver aktiveras under just nedtrampningsrörelsen, nämligen de muskler som förmår påföra pedalen tryckkraft.

## Uppfinningens syften och särdrag

Föreliggande uppfinning tar sikte på att undanröja ovannämnda brister hos tidigare kända cyklar och skapa en förbättrad cykel. Ett grundläggande syfte med uppfinningen är sålunda att skapa en cykel som möjliggör en allsidigare träning och som

med enkla medel gör användaren uppmärksam på sådana moment då kroppsarbetet ej utförs på ett fysiologiskt optimalt sätt.

Enligt uppfinningen nås ovannämnda syfte medelst de särdrag som är angivna i patentkravets 1 kännetecknande del. Fördelaktiga utföranden av uppfinningen är vidare definierade i de osjälvständiga patentkraven.

Kort beskrivning av bifogade ritningar

På ritningarna är:

Fig 1 en perspektivvy av den uppfinningsenliga cykeln,

Fig 2 en delvis skuren planvy visande en i cykeln ingående trampmekanism jämte ett balanshjul,

Fig 3 en förstorad sprängvy visande en i balanshjulet ingående navkonstruktion,

Fig 4 en sidovy av en i navkonstruktionen ingående koppling i ett första funktionstillstånd, och

Fig 5 en analog sidovy visande samma koppling i ett andra funktionstillstånd.

Detaljerad beskrivning av ett föredraget utförande av uppfinningen

Den i fig 1 visade cykeln innefattar en i sin helhet med 1 betecknad stomme samt ett relativt denna roterbart lagrat hjul 2 i form av ett balanshjul. Stommen 1 är sammansatt av ett underrede 3, en med ett stödhandtag 4 försedd, främre gaffel 5 samt en bakre ståndare 6 som bär en sadel 7. Mellan framgaffeln 5 och ståndaren 6 sträcker sig ett mellanstycke 8. Bakåt från framgaffelns båda åtskilda skänklar sträcker sig schematiskt antydda konsoler 9 som bär en axel 10 för hjulet 2. Ett på mellanstycket 8 monterat bromsdon 11 har till uppgift att påföra balanshjulet en varierbar bromseffekt. I det visade exemplet inbegriper bromsdonet 11 ett mot hjulets periferi verkande belägg 12 som kan ansättas olika hårt mot hjulet med hjälp av en skruv.

För att driva hjulet 2 är anordnad en mekanism som inbegriper två trampdon 13, 13' som vart och ett har en arm 14 med en vinkelställd pedal 15, närmare bestämt en pedal av det slag som inbegriper en bygel 16 i vilken den främre delen av en användares fot kan stickas in.

Så långt den visade cykeln hittills beskrivits är densamma i allt väsentligt tidigare känd.

Nytt och karakteristiskt för den uppfinningsenliga cykeln är att de båda trampdonen 13, 13' är individuellt lagrade i två olika lager 17, 17' (se fig 2) och förbundna med balanshjulet 2 via två olika transmissioner 18, 18'. I det visade exemplet utgörs dessa transmissioner av i och för sig kända, ändlösa kedjor, vilka framtill står i ingrepp med första tand- eller kugghjul 19, 19' och baktill samverkar med andra tand- eller kugghjul 20, 20' ingående i de båda trampdonen 13, 13'.

Nu hänvisas till fig 3 som i detalj illustrerar balanshjulets navkonstruktion. Axeln 10 är införbar i hål 21 i konsolerna 9 och fixerbar relativt dessa med hjälp av skruvar 22 och brickor 23. Axelns läge kan fininställas med hjälp av ställskruvar 24. På axeln 10 är roterbart lagrat ett rörstycke 25 som är vridstyvt förbundet med balanshjulet 2 via fläns-ringar 26 vilka är anfästbara mot hjulet via skruvförband 27. Ehuru lagringen av rörstycket 25 relativt axeln 10 kan förverkligas på olika sätt föredras i praktiken nållager 28 för detta ändamål. Vid varje ände av rörstycket 25 är på axeln 10 vidare roterbart lagrade tvenne hylsor 29, 29' med vilka de båda främre tandkransarna 19, 19' är vridstyvt förenade. Även hylsorna 29, 29' är med fördel lagrade på axeln med hjälp av nållager 28.

I vart och ett av rörstyckets 25 båda ändpartier är utformade ett antal urtagningar 30 vilka var för sig avgränsas av tangentiellt åtskilda, motstående ansatsytor 31, 32. Varje dylik ansatsyta sträcker sig lämpligen radiellt i förhållande till axelns geomemtriska centrumaxeln, dvs i rät vinkel mot en tangent till axelns cylindriska manatelyta. På så sätt erhåller urtagningen sektorartad form, såsom tydligt framgår av fig 4 och 5. I det visade exemplet inbegriper rörstycket tre ekvidistant åtskilda urtagningar. I detta fall kan den sektorformade urtagningen ha en båglängd exempelvis inom området 40-80°, lämpligen 50-70°.

Ett mot antalet urtagningar 30 svarande antal medbringare eller fingrar 33 är utformade på det inåt vända ändpartiet av varje hylsa 29, 29'. Även dessa fingrar 33 är tvärsnittsvis

sektorformade, ehuru med en båglängd som är mindre än båglängden hos en samverkande urtagning 30 i vilken fingret griper in. I praktiken kan det enskilda fingret har en sektorbåglängd som är 15-25° mindre än urtagningens båglängd. I likhet med urtagningarna 30 är fingrarna 33 ekvidistant åtskilda. Genom att det enskilda fingret är mindre än tillhörande urtagning kan den enskilda hylsan 29 resp. 29' röra sig mellan motsatta ändlägen relativt rörstycket 25, nämligen mellan ett ändläge i vilket främre ansatsytor på fingrarna anligger mot främre ansatsytor i urtagningarna och ett motsatt ändläge i vilket bakre ansatsytor på fingrarna anligger mot bakre ansatsytor i urtagningarna.

Uppfinningens funktion och fördelar

Föreliggande uppfinning bygger på insikten att fysiologiskt optimala träningsresultat ernås först om den tränandes båda ben kontinuerligt arbetar hela varv, dvs icke blott under det halva varv då det enskilda benet genomför en nedtrampningsrörele, utan även under varje efterföljande returrörelse då pedalen skall föras bakåt från sitt undre dödpunktsläge mot sitt övre dödpunktsläge. Av detta skäl är den uppfinningsenliga cykelns båda pedaler utrustade med medel för fixering av den tränandes fot eller sko. I det visade exemplet inbegriper pedalerna 15 en konventionell bygel 16 i vilken foten kan stickas in. Det är emellertid även tänkbart att utforma pedalen med andra medel för samma ändamål, t ex snäppfästen för den tränandes skor. Det väsentliga är blott att foten kan aktivt medbringa pedalen icke blott under nedtrampningsfasen utan även under returfasen.

Optimal kroppsträning ernås då användarens båda ben kontinuerligt påför balanshjulet 2 drivkraft. Då den ena pedalen, t ex den som ingår i trampdonet 13 för användarens vänstra ben, trampas ned kommer tillhörande koppling i balanshjulets navkonstruktion att överföra kraft till balanshjulet genom att kopplingshylsans 29 tre medbringarfingrar 33 ansätts mot de främre ansatsytorna 31 såsom illustreras i fig 4. Om det högra benet under den samtidiga returrörelsen för tillhörande pedal arbetar aktivt, dvs driver eller lyfter pedalen uppåt kommer även kopplingshylsan 29' att arbeta på samma sätt, dvs kopplingshylsans 29' medbringarfingrar kommer att ansättas mot de främre ansats-

ytorna 31 i tillhörande urtagningar 30. Härvid driver även det högra benet balanshjulet på ett aktivt sätt. Om emellertid det högra benet ej skulle aktiveras i samma utsträckning som det vänstra kommer kopplingshylsan 29' att släpa efter eller fasförskjutas i förhållande till den med det vänstra benet samverkande kopplingshylsan 29. Detta får till följd att varje enskilt medbringarfinger på kopplingshylsan 29' kommer att röra sig ett stycke bakåt i tillhörande urtagningar och på mycket kort tid stöta emot urtagningarnas bakre ansatsytor 32. Såsom verifierats genom utförda prov ger denna stöt upphov till ett oljud som är lätt hörbart av användaren. Denne uppmärksammas då på ett distinkt sätt att det aktuella benet ej arbetar lika aktivt som det andra benet; något som i sin tur ger möjlighet att omedelbart korrigera detta arbetssätt helt enkelt genom att påföra det aktuella benet mer muskelkraft.

I praktiken torde vanligast förekomma att det lyftande benet kommer att släpa efter det nedtrampande benet. Den uppfinningsenliga konstruktionen möjliggör emellertid även korrigering av det omvända förhållandet, om detta till äventyrs skulle inträffa.

En väsentlig fördel med den uppfinningsenliga cykeln är att densamma med hjälp av enkla, mekaniska medel skapar förutsättningar för en allsidig kroppsträning i det att användaren medvetandegörs huruvida det ena benet icke arbetar på ett optimalt sätt, varigenom momentan korrigering kan ske. Med andra ord skapas förutsättningar för en intensifierad träning under vilken aktiveras ett flertal ytterligare muskelgrupper utöver de som krävs för enbart nedtrampning av en pedal under ett halvt varv.

Tänkbara modifikationer av uppfinningen

Uppfinningen är ej begränsad blott till det beskrivna utförandeexemplet. Ehuru uppfinningen ovan beskrivits enbart i samband med en orörlig träningscykel kan densamma även tillämpas i samband med flerhjuliga, rörliga cyklar, t ex tävlingscyklar. I sistnämnda fall kan den beskrivna konstruktionen utnyttjas icke blott i syfte att intensifiera kroppens muskelarbete, utan även i syfte att öka drivningen av ett hjul och därmed cykelns topphastighet. Med andra ord kan uppfinningen

även utnyttjas för ernående av en förbättrad verkningsgrad i cyklingsarbetet som sådant. Ehuru de båda kopplingarna mellan kedjorna och hjulet i exemplet är utförda med tre medbringare som samverkar med lika många urtagningar i det på axeln lagrade rörstycket kan även färre medbringare, t ex blott en, användas. Det må även påpekas att andra transmissioner, t ex kilremmar, kan användas i stället för just kedjor. Ävenledes kan de smalare medbringarna vara utformade på det mittre rörstycket och de bredare urtagningarna vara utformade i de tandkransförsedda hylsorna. Avslutningsvis skall nämnas att den individuella monteringen av trampdonen i två åtskilda lager gör det möjligt att placera trampdonen på olika nivåer. På så sätt kan cykeln användas av människor med handikapp vad avser ben och fötter, t ex människor med olika långa ben. Härvid är det även tänkbart att utföra åtminstone det ena lagret ställbart och fixerbart i olika lägen.

Patentkrav

1. Cykel innefattande en stomme (1) och ett relativt denna roterbart lagrat hjul (2), som är drivbart med hjälp av två trampdon (13, 13') inbegripande pedalförsedda armar (14), k ä n n e t e c k n a d därav, att de båda trampdonen (13, 13') är individuellt lagrade i olika lager (17, 17') och förbundna med hjulet (2) via två olika transmissioner (18, 18'), som var för sig samverkar med en mekanisk koppling vilken innefattar en medbringare (33) som är rörlig mot och från motsatta ansatsytor (31, 32) av vilka en första (31) ombesörjer drivning av hjulet (2) då medbringaren (33) i ett aktivt tillstånd ansätts mot densamma, och den andra (32) ger upphov till oljud då medbringaren i ett inaktivt tillstånd stöter emot densamma.

2. Cykel enligt krav 1, k ä n n e t e c k n a d därav, att såsom medbringare tjänar ett finger (33) vilket är anbragt på en med den enskilda transmissionen (18, 18') samverkande hylsa (29, 29'), som är vridbart lagrad relativt en central axel (10) för hjulet (2), och vilket griper in i en mellan sagda första och andra ansatsytor (31, 32) avgränsad urtagning (30) i en med hjulet (2) vridstyvt förenad del (25).

3. Cykel enligt krav 2, k ä n n e t e c k n a d därav, att hylsan (29, 29') uppvisar tre fingrar (33) som griper in i ett motsvarande antal urtagningar (30) i sagda hjuldel (25).

4. Cykel enligt något av föregående krav, k ä n n e t e c k n a d därav, att den enskilda transmissionen utgörs av en ändlös kedja (18, 18') som står i ingrepp med dels en första tandkrans (19, 19') som är förbunden med kopplingen, dels en andra tandkrans (20, 20') som är förbunden med trampdonet (13, 13').

Sammandrag

En cykel innefattar en stomme (1) och ett relativt denna roterbart lagrat hjul (2), som är drivbart med hjälp av två trampdon (13, 13') inbegripande pedalförsedda armar (14). De båda trampdonen (13, 13') är individuellt lagrade i olika lager och förbundna med hjulet (2) via två olika transmissioner (18, 18'), som var för sig samverkar med en mekanisk koppling vilken innefattar en medbringare som är rörlig mot och från motsatta ansatsytor av vilka en första ombesörjer drivning av hjulet (2) då medbringaren i ett aktivt tillstånd ansätts mot densamma, och den andra ger upphov till oljud då medbringaren i ett inaktivt tillstånd stöter emot densamma.

Publikationsbild: Fig

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 99/00915

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A63B 22/08, A63B 69/16
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | US 5735774 A (J.D. MARESH), 7 April 1998 (07.04.98) -- | 1-5 |
| A | US 5433680 A (P.D. KNUDSEN), 18 July 1995 (18.07.95) -- | 1-5 |
| A | US 4550906 A (D. IM), 5 November 1985 (05.11.85) -- -------- | 1-5 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
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| Date of the actual completion of the international search | Date of mailing of the international search report |
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Information on patent family members

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| US 5735774 A | 07/04/98 | NONE | |
| US 5433680 A | 18/07/95 | NONE | |
| US 4550906 A | 05/11/85 | NONE | |